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A FIELD MEETING OF PATHOLOGISTS

WILLIAM A. MURRILL

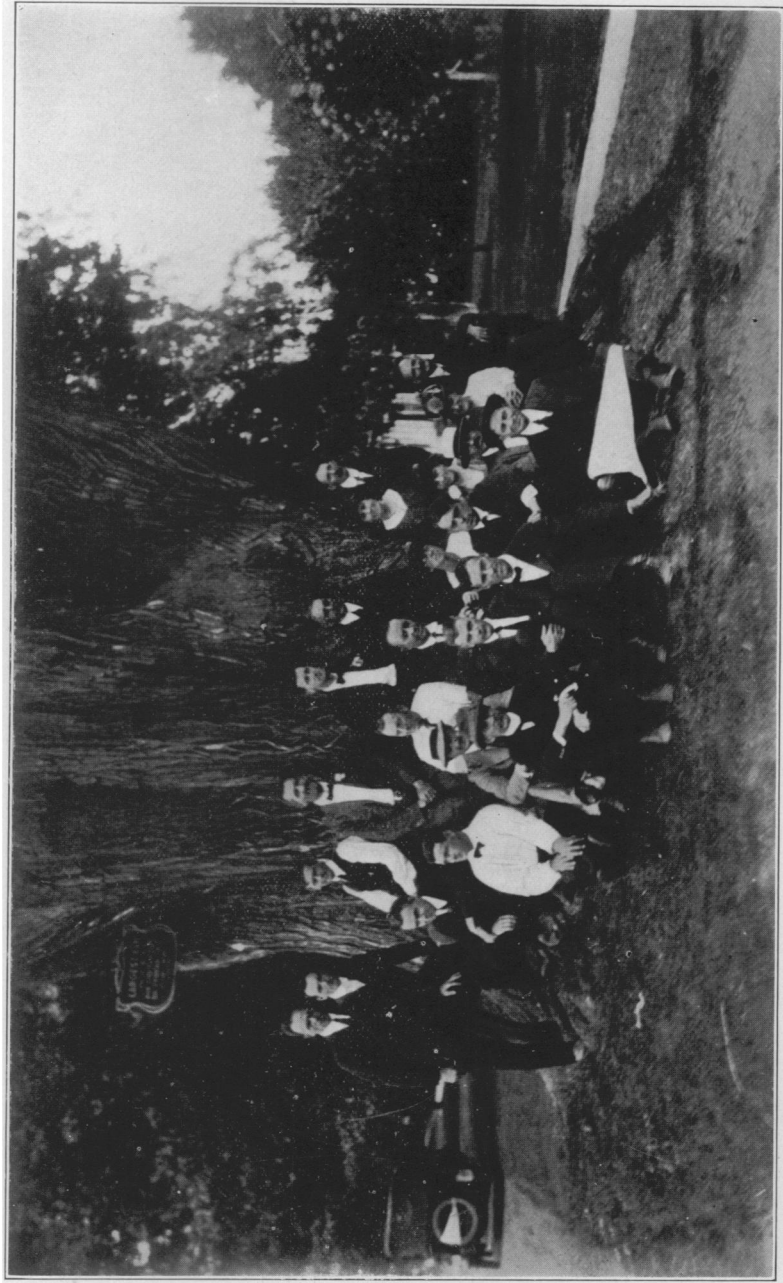
(WITH PLATE 15)

The writer was invited to represent the New York Botanical Garden at a meeting of plant pathologists and Connecticut farm bureau agents, held during the week beginning August 18 at New Haven, Storrs, and elsewhere, for the discussion of some of the most important problems now confronting the Connecticut farmers, fruit growers, and truck gardeners. About twenty botanists, mostly from New England and New York, were present; while several hundred other persons were in attendance at special meetings. The evenings were devoted to brief papers and discussions; the mornings and afternoons to automobile tours through the plantations between New Haven, Hartford, and Storrs. A distance of three hundred miles was covered in these tours, during which time the weather was most delightful.

The meeting on Monday evening at the Graduates Club of New Haven, presided over by Dr. E. H. Jenkins, was devoted to a variety of general subjects, such as "Plant Pathology and the College Course," "Closer Relations between France and America," "Entomology and Pathology," "Tropical Forestry," "The Botanical Garden and the Pathologist," and "Reminiscences of Dr. Farlow."

On Tuesday morning, various departments of the Agricultural Experiment Station were visited and then a tour made of orchards and farms showing peach and apple spraying experiments, peach yellows, potato tests, corn breeding experiments, effects of fertilizers on fungi, etc.

In the afternoon, the Yale Botanical Laboratories were inspected under the guidance of Professor Evans and Dr. Whitford; after which the party went on a long journey through the market gardens of Highwood and Westville, the Elm City Nur-



BENEATH THE WETHERSFIELD ELM

Photo by Prof. Morse

sery, and the seed farms of Orange, Milford, and Woodmont. At the nursery, Mr. Coe exhibited many dwarf trees he had brought from Japan, as well as an interesting climbing Hydrangea, excellent for walls, and the original plants and parents of the hybrid box privet, a border shrub of great promise. An hour's stop was made at Savin Rock for dinner, and then the party proceeded to the Assembly Hall of the Experiment Station for the evening meeting.

Dr. Hartley, Director of the Rhode Island Experiment Station, presided at this meeting, the general subject of which was "Tree Diseases." Dr. A. H. Graves spoke on "Resistant Chestnut Trees"; Dr. Florence McCormick on "White Pine Blister Rust"; Professor Butler and Mr. Stoddard on "Spraying Trees"; and Dr. Clinton on "Peach Yellows." Most of these talks were illustrated with lantern slides and some with microscopic mounts. It seems to be established that blister rust infects pine needles through their breathing-pores; and that peach yellows, probably an enzymatic disease, may be transmitted from one tree to another by grafting with bud or bark.

An early start was made Wednesday morning for Storrs, where the Agricultural College and Extension Bureau are located. The first stop was at the Barnes Brothers' apple, pear, and peach orchards, to see a commercial plantation of dwarf McIntosh apples; a dusting machine in operation throwing clouds of dry sulphur in the air; and a peach orchard that had been entirely renewed and probably saved from yellows by proper treatment with sodium nitrate and other fertilizers.

The largest greenhouses in America are located at Cromwell. About 22 acres are under glass, one house being 800 feet long by 82 feet in width and another 500 by 480 feet, the latter entirely filled with roses. Ferns, begonias, palms, carnations, chrysanthemums, etc., are also grown in abundance and under the very best conditions. The establishment was far too large to admit of a thorough examination, so we inspected a few of the larger houses, the storage rooms, and the packing rooms, and then continued our journey toward Hartford.

At Wethersfield, we grouped ourselves beneath the largest elm

in the United States while Professor Morse and Professor Torrey took photographs. This remarkable tree is 30 feet in circumference, 97 feet high, and 250 years old, the branches spreading 75 feet from the trunk in all directions. It stands on the edge of the highway without protection of any kind.

Elms, sugar maples, and plane-trees were the commonest roadside trees in the regions visited, many of them being old and very handsome. A sugar maple was seen at Wapping that measured 17 feet in circumference and 80 feet in height. On account of the wet season, fruit-bodies of large fungi were common on the trunks of various trees, *Fomes populinus* being often observed on sugar maples and *Spongipellis galactinus* on apple trees. Both of these polypores are white and visible at long distances. Many examples of bad tree doctoring were in evidence along the principal highways.

Lunch was taken in Hartford near the Morgan Memorial, after which we left at top speed for Storrs, finely located among the hills with a broad view of the surrounding mountains and valleys. The only dining-room in the place has a reputation for closing very promptly, hence our haste. All of the remaining daylight was utilized in inspecting the potato fields, orchards, greenhouses, dahlia garden, and botanical garden, under the guidance of Professors Slate, Hollister, Fraser, and Sinnott.

The evening session was devoted to a historical sketch of tobacco growing in Connecticut, by Dr. Jenkins, and a discussion of potato, tobacco, and market garden diseases by Messrs. Morse, Chapman, and others. Dr. Olive also discussed the relation of the botanical garden to the public.

Thursday was a very important field day, devoted chiefly to tobacco. Leaving Storrs shortly before nine, the first stop was made at East Windsor Hill to see the fields of broad leaf tobacco in that vicinity and the Haviland plantation of tent Cuban tobacco, with narrow leaves.

Considerable "rust," or "burn," was found on tobacco grown in the open. Many of the upper leaves were scalded like maple leaves on a hot day after a spell of rainy weather. Some showed small brown spots and others white spots, the latter resembling

insect work. All of these injuries may possibly have been due to the "mosaic," or "calico," disease, which renders the leaf thin and sickly, and unable to resist sudden changes in atmospheric conditions. Many plants showed yellow lower leaves, doubtless due to lack of potash or other fertilizer trouble.

Tobacco mosaic, like potato mosaic and peach yellows, is a very widespread and mysterious disease. It may be carried far and wide through the field by simply touching the leaves with infected hands. In old plants, if the lower leaves are touched, they will not take the disease, but will communicate it to the younger leaves and suckers at the top. The danger to the crop comes in handling the seedlings, which if infected develop into weaker plants of less value. When the crop is far advanced, there is little need for caution, since the sources of infection are always destroyed during the winter.

On Thursday afternoon, after an excellent lunch at Thompsonville, the Havana tobacco district at Suffield was visited and an inspection made of various experiments in progress there under the direction of Mr. Clayton. Johnson's susceptible burly, grown for comparison, was found to be badly affected with *Thielavia* root-rot, which turns the tips of the roots brown or black, while in *Fusarium* root-rot the lesions are lighter in color. These rots are readily seen after the roots have been rinsed in water.

The last stop of the day was made at the extensive tented fields of the American Sumatra Tobacco Company, where 290 acres are under cloth costing a million dollars, and 67 acres are covered by a single tent. The yield this year is enormous, probably because of the plentiful rains. After several bad years, a number of growers in the district had turned their fields out to rest or were cultivating them in corn, timothy, and other crops for a change, which seemed unfortunate in view of the present tobacco yield.

This company is transporting men, women, and children by the hundreds in motor trucks from Hartford to harvest the crop. The lower leaves are taken off, four or six at a time, as they ripen and hauled in covered baskets to the barns, where they are strung on cords fastened to sticks and hoisted into the barns to dry. In

damp weather and at critical periods a little charcoal is used. When winter comes, the tobacco is sweated, sorted, graded by experts, and packed for shipment. It brings over a dollar a pound.

The tobacco growing district of Connecticut is limited to the valley of the Connecticut River and other localities at least twenty miles from the ocean where the soil is light and rich in organic matter. A great deal of fertilizer is necessary. The seed-beds must be sterilized with great care and the best seed used. After a certain number of crops, the land must be rested and renewed by growing other crops upon it.

On Thursday evening Dr. Olive, Professor Sinnott, and the writer were the guests of Dr. Clinton, who planned the meetings and did so much to make them a success. The following list of botanists in attendance was furnished by him.

Prof. A. W. Evans and Dr. H. N. Whitford, of Yale, and Dr. A. H. Graves, formerly of Yale.

Dr. E. W. Olive, of the Brooklyn Botanic Garden.

Professors E. W. Sinnott and G. S. Torrey, of Storrs.

Professors A. V. Osmun and W. S. Krout, and Dr. G. H. Chapman, of the Amherst Agricultural College.

Prof. W. J. Morse, of the Maine Experiment Station.

Prof. O. R. Butler, of the New Hampshire Experiment Station.

Prof. M. F. Barrus, of the Cornell Experiment Station.

Dr. W. A. Murrill, of the New York Botanical Garden.

Dr. G. R. Lyman, of the Disease Survey, B. A. Porter, of the Entomological Division, and E. E. Clayton, of the Tobacco Work, of the U. S. Dept. of Agriculture.

Dr. Grace Clapp, of Smith College.

Dr. Florence A. McCormick, E. M. Stoddard, and G. P. Clinton, of the Connecticut Experiment Station.

NEW YORK BOTANICAL GARDEN.